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THE ALCYONARIA & HYDROCORALLINAE OF THE CAPE OF GOOD HOPE.

BY

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INTRODUCTION.

The specimens of Alcyonaria described in these pages were sent to me in four parcels during the years 1898 and 1899.

They were all killed when caught and very carefully preserved so that the details of their anatomical structure, both general and minute, could be studied with satisfactory results.

Freshly killed Alcyonarians, however, present this difficulty to the systematist that they are so different in general aspect from the dried specimens upon which the species have, in most cases, been founded that their identification, even when the types can be compared with them, is often unsatisfactory. I have done the best I could not to add new names to our literature unnecessarily, and have allowed a wide margin for possible local variation of widely distributed species. Four species, however, present features which separate them so markedly from anything hitherto described, that it is necessary to regard them as new to science, and for one of these the new genus Acrophytum is proposed.

The new species are Heteroxenia capensis, Sarcophytum trochiforme, Acrophytum claviger, and Gorgonia capensis.

It is perhaps premature to make any general statement concerning the Cape Alcyonarian fauna as a whole, as it is probable that several species new to the district have still to be brought to light, but so far as the collection goes it may be regarded as fairly characteristic of a temperate region bordering on the tropics. The tropical Indian Ocean forms are represented by such genera as Heteroxenia, Sarcophytum and Cavernularia, while the species Alcyonium antarcticum and possibly the species of Gorgonia have a wider distribution in the Southern Sea. Tropical Alcyonarians are frequently characterised by large spicules, abundance of spicules, or by massive skeletal structures, as exemplified by such genera as Alcyonium (tropical species), Spongodes, Tubipora, Heliopora, etc., but the Cape Alcyonarians are, if we may judge from this collection, more fleshy and soft, as the genera or species of the temperate regions usually are.

The excellent state of preservation of the specimens in this collection has afforded me plenty of material for the study of certain anatomical features which are not usually taken into consideration in systematic work, and I have devoted a considerable amount of time to the structure of the stomodaeum, mesenterial filaments, canal systems, and the mesogloeal structures of some of the species, in order to determine with greater certainty the value of the specific characters hitherto used by systematists. As my investigations on these points are not yet completed, however, I have decided to publish the systematic part of my work with only occasional references to them ; but I hope before long to have ready for publication a more extensive treatise on Alcyonarian structure, based in large measure on the Cape specimens. I take the opportunity to make this statement because I am anxious that the naturalists at the Cape who have taken so much care and exhibited so much skill in sending the material to England well preserved, should not feel that my interest in it ceases when I have labelled the specimens with names. There is one feature, however, due to the specimens being well preserved in spirit that I have incorporated in this paper, as I think it is worthy of consideration in connection with fishery matters. The Alcyonaria, like other Anthozoa, are apparently distasteful to fish. I believe there is no record of any fish that feeds on Alcyonaria, except Pennatulids, either regularly or spasmodically, and in my experience they never show any signs of having been nibbled or bitten by any animal provided with teeth. But with this statement the interest in them from the fishery standpoint should not cease. Every year the female colony shoots out into the water a large number of eggs which, being provided with a considerable quantity of yolk and having no spicules nor offensive weapons in the form of thread cells, may form a substantial meal to certain species of fish. This is, of course, simply a suggestion, as there is no evidence that fish do feed upon these ova, but I venture to think it is a suggestion worthy of some experimental inquiry. For this reason I have added a statement concerning the condition of the sexual organs of each species. The isolated observations I have been able to make do not give satisfactory results, but they seem to point to the existence of two spawning seasons among the Alcyonarians. Heteroxenia and Gorgonia capensis probably spawn in June or July, while Alcyonium pachyclados, Cavernularia (both species), Juncella, and Acrophytum spawn in December, January, or February.

There are not many references in literature to Alcyonaria from the Cape of Good Hope. Ellis and Solander described Gorgonia flammea in 1786. Möbius, in 1861, described Solanderia verrucosa from Algoa Bay, the name being afterwards changed by Kölliker to Spongioderma verrucosum, and from the same locality a new species of Lophogorgia, namely, L. crista. In 1878, Studer described Isidella (Primnoisis) capensis, Eunicella papillosa, Anthelia capensis, Leptogorgia palma (Gorgonia flammea) and Eunicella albicans.

Verrill (18) enumerated the following species of Alcyonaria from the Cape of Good Hope.

Euplexaura capensis, Leptogorgia flammea, Eunicella palma, Eunephthya thyrsoidea. It is impossible to determine what the Euplexaura is that he refers to here, as he gives no figure. The description of the spicules does not correspond with any of the spicules from the present collection. Leptogorgia flammea (Verrill) is the same as the Gorgonia flammea of our collections, Eunicella palma = Gorgonia albicans of Kölliker is included in Studer's genus Platygorgia. I cannot, however, identify any of my specimens with this species. The Eunephthya was obtained in False Bay at a depth of 20 fathoms. Verrill gives a figure which, although not very satisfactory, is sufficient to indicate that the species is not in our collection. The colour is described as wine yellow or light brown.

As it may be of some service to those who have opportunities of examining Alcyonarians from localities in the neighbourhood of the Cape, I append a table showing the names and distribution of the species sent to me :—

Names.	Locality.	Depth.
Heteroxenia capensis n. sp.	False Bay	20 fms.
Alcyonium pachyclados Klunz.	off Cape St. Blaize and off Algoa Bay	15-18 fms. 25 fms.
Alcyonium antarcticum W. & S.	17 miles E. of E. London	45 fms.
Acryphytum claviger n.g. et sp.	Algoa Bay	26 fms.
Sarcophytum trochiforme n sp.	17 miles E. of E. London	45 fms.
Melitodes dichotoma. Pall.	False Bay	31 fms.
Spongioderma verrucosum Mob.	off Algoa Bay	25 fms.
Gorgonia flammea. E. & S.	all along the coast in shallow water.	
Gorgonia capensis, n. sp.	10 miles off C. St. Blaize	40 fms.
Juncella elongata. Pall.	off Algoa Bay	25 fms.
Eunicella papillosa. Esp.	off Algoa Bay	25 fms.
Primnoisis capensis. Studer	off Algoa Bay	25 fms.
Villogorgia mauritiensis. Ridley	off East London	85 fms.
Virgularia Reinwardti. Herk.	St. Francis Bay	30 fms.
Cavernularia elegans. Herk.	False Bay	25 fms.
Cavernularia obesa. Val.	near Port Alfred	40-43 fms.

SUB-ORDER ALCYONACEA.

FAM. XENIIDAE.

HETEROXENIA CAPENSIS, n. sp.—PLATE IV., FIG. C.

Two specimens, supposed at first to belong to Studer's species, Anthelia capensis, were procured in False Bay on the 24th of March, 1898, at a depth of 20 fathoms. One of these specimens was sent to me, and at the first glance I thought the identification was justified. As soon as I cut out a small segment of the colony it was clear that the specimen was either a Xenia or closely allied to it. The deceptive appearance of the specimen is due to the fact that the stalk is completely covered by a milky white encrusting mass of the compound Ascidian Leptoclinum speciosum (Herdman), which so completely hides it that the Alcyonarian polyps appear to spring from flat plate-like stolon encrusting a solid white substance. An examination of sections of the colony prove it to be a new species of the genus Heteroxenia Köll.

The colony is 45 mm. high by 37 mm. in diameter at the crown, cylindroidal in form, the stem covered with an encrusting growth of the Tunicate Leptoclinum. The Autozooids protrude about 6 mm. from the coenenchym, but are in some cases retracted. The tentacles of the autozoids, from 4-6 mm. in length, usually provided with one row of 8-10 pinnules on each side. The siphonozoids numerous and not prominent. Spicules very scarce ; absent in the polyps ; rarely more than 0.01 mm. in greatest diameter. The colour in spirit is brown.

Locality : False Bay, Cape of Good Hope. 20 fathoms

Only one other species of this genus is known, namely, Heteroxenia Elizabethae Köll, which occurs at Port Denison (Kölliker) and Zanzibar (Bourne). Fortunately, in the writings of Kölliker, Bourne, and Ashworth we have an excellent description of the anatomy of this species. It differs from our new species in the following characters :— The exsert portions of the autozoids are much longer, namely, 10-28 mm. in length, and their tentacles have three rows of pinnules on each side. The siphonozoids protrude about 2 mm. from the surface of the coenenchym, and are provided with rudimentary tentacles. The spicules are numerous in the autozooids.

In some respects Heteroxenia capensis resembles X. rigida Xenia. May (11) from Mozambique, in which the polyps protrude not more than 10 mm. from the coenenchym, and the tentacles possess one row of pinnules on each side. The specimen examined by May, however, was not very well preserved, and no evidence of dimorphism was discovered.

The number of rows of pinnules on the tentacles of the polyps of the Xeniidae is the character which is undoubtedly of some value in the determination of species but it presents some difficulties. In some of the autozooids of Heteroxenia capensis which were fully expanded there appeared to be clearly one row of pinnules only on each side of the tentacles ; but in others the pinnules were in two rows or irregularly distributed on the margins. I am inclined to think that the latter effect is partly if not wholly due to retraction.

There can be little doubt that the Cape species differs from other Xeniidae in its greater degree of retractility, some of the autozoids in the specimen being completely retracted. Before this can be accepted as a character of systematic importance we must await observations of the living animals.

The specimen was male but the sexual cells were not ripe on March 24th.

FAM.: ALCYONIDAE.

ALCYONIUM PACHYCLADOS. Kl.

Three specimens, one white, one yellow, and one red, must all be referred to this species.

The red specimen was found attached to a large piece of coarse sandstone 6¼ miles S.W. by W.¼W. of Cape St. Blaize. Depth : 15-18 fathoms. Bottom : stones.

Four specimens were taken in this haul, one of which was sent to me.

The white specimen was got off Algoa Bay close to Rij Bank, long. 25° 51′ 30″ E., lat. 33° 58′ S. Depth: 25 fathoms. Bottom : dark sand with black specks. Only two specimens were obtained. The yellow specimen was obtained in the same haul as the white specimen and was the only one obtained.

The measurements of the three colonies are as follows :—

	Height of Colony.	Length of stalk.	Branches.
White specimen ..	50 mm.	18 mm.	10 mm.
Red specimen ..	22 mm.	8 mm.	7 mm.
Yellow specimen ..	55 mm.	23 mm.	22 mm.

The spicules of the coenenchym are double clubs with short or very short connecting bars, about .05 mm. long by .03 mm. broad.

The type specimen of this species is 8-10 cm. long by 2-10 cm. in height, and the colour clear greyish white. The spicules of the type specimen are 0.08 — 0.096 mm. long by 0.48 broad. In the absence of any knowledge of the anatomy of this species, the identification of the Cape specimen with Alcyonium pachyclados may appear doubtful.

The differences in the measurements given above between the type and the Cape specimens do not, in my opinion, justify the separation of the latter into a new species.

Of the three specimens sent to me the yellow and the white specimens resemble each other more closely than either resembles the red specimen. But the latter is smaller and in other respects more dwarfed in growth than the other two, the branches being shorter and finer.

In order to satisfy myself that it really belonged to the same species I compared a series of longitudinal sections through a branch of this series with a corresponding series taken from the other two. I then discovered that the red specimen is a female, the yellow specimen a male and the white one apparently in a neutral condition. Apart from this These / point, which may be one of sexual difference, three specimens are identical in all essential anatomical details

ALCYONIUM ANTARCTICUM. W. & S. PLATE IV. A.

Two specimens from lat. 32° 53′ S., long. 28° 12′ E., about 17 miles E. of East London, were procured by the dredge, December 23rd, 1898, depth 45 fathoms. Bottom : sand and mud (by lead), coralline material (by dredge).

Each specimen consists of a globular head 9-10 mm. in diameter situated on a short stalk (barren stem) rising from a thin membraneous stolon of considerable extent spreading over a compound annelid skeleton.*

In the larger specimens the polyps are only partially retracted, and the globular head and polyps are fairly translucent. The tentacles and the wall of the stomodaeum are all crowded with pink spicules. The coenenchym is white, but here and there a faint pinkish tint may be seen, due to scattered pink spicules occurring in it. The stalk is brownish in colour, hard and leathery in texture and covered with wrinkles. It is difficult to say how far this is due to post-mortem contractions.

The smaller specimen is faintly yellow in colour. The stolon is missing.

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* Having but a small amount of this material, which consists of very hard conglomerated sand, I have not been able to identify it at present, but it appears to be formed by an annelid.

The spicules (of the larger specimen) are of two kinds:—1st, long narrow warted spindles (Plate IV., Fig. A'), 0.3 m. by .025 mm., pinkish in colour, occurring in the tentacles and stomodaeum; 2nd, irregular spicules occurring in the superficial parts of the coenenchym. These are principally long double clubs (Plate IV., Fig. A'), and their average size is about .07 mm. by .06 mm. In the deeper parts of the coenenchym the spicules are similar in many respects to the spicules of the tentacles, but many of them are so much longer that they assume the shape which should be called technically that of needles. I have measured some of these that were over 0.5 mm. in length.

One specimen was searched for the sexual organs but was found to bear none.

The type specimen of Alcyonium antarcticum was obtained by the *Challenger* in 75 fathoms off Heard Island. It was considerably larger than either of the two specimens from the Cape, being 130 mm. in greatest diameter, and rising to a height of 55 mm. A quite similar form, but probably a young colony was found by Studer at the Cascade Ridge in N.E. Kerguelen, on the skin of a Macrocystis; its colour in life was noted as "pale red." Unfortunately the specimen was lost.

ACROPHYTUM CLAVIGER.

NOV. GEN. ET SPEC. PLATE IV. B.B'.

Two specimens out of three obtained in Algoa Bay at a depth of 26 fathoms were sent to me. They must be placed in a new genus, for which I propose the name Acrophytum *.

Three genera belonging to the family Alcyonidae have been described as being dimorphic Sarcophytum (Lesson), Lobophytum (v. Marzeller), and Anthomastus (Verrill).

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The genus Anthomastus should not, in my opinion, be recognised, as there is not sufficient ground for separating the species on which it was founded from Sarcophytum. The differences between the genera Sarcophytum and Lobophytum, as described by Von Marenzeller (10) do not appear to be of very great importance, but for reasons which will be set out in a later publication, I am inclined to retain both generic names.

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* I am aware that the name Acrophytum has been previously used in Botany, but the species have been merged in the genus Cordiceps and the name does not appear in the Index Kewensis.

The specimens from the Cape differ in form from both these genera, and associated with this there is a marked difference in the character and distribution of the spicules, as well as important differences in anatomical details. Under these circumstances the formation of a new genus is imperative.

The brief description of the genus is as follows :—

GENUS ACROPHYTUM. PLATE IV., FIGS. B.B'.

Colony unbranched, of the form of an elongated cone. Stalk not more than one-fourth part of the total length of the colony. Polyps dimorphic. Siphonozooids relatively fewer than in the genera Sarcophytum and Lobophytum. Spicules of the coenenchym numerous in the superficial ectoderm, rare or absent in the deeper parts of the colony. Ova very large.

One species is known, Acrophytum claviger discovered 6th December, 1898, Algoa Bay, lat. 33° 53′ 15″, long. 25° 51′ 43″ E. Depth: 26 fathoms. Bottom: sand.

Description of the specimens :—

	Specimen A.	B.
Total length of the Colony ..	125 mm.	70 mm.
Length of stalk	30 mm.	22 mm.
Diameter of the stalk ..	26 mm.	16 mm.
Diameter of rachis at its widest part	30 mm.	21 mm.

In both specimens the autozooids project from the coenenchym about 4 mm. and the diameter of the spread of the tentacles is about 3 mm. The pinnules are very numerous, completely covering the oral face of the tentacles. The siphonozooids may be seen scattered between the autozooids as minute rounded prominences perforated at the apex by a mouth. The surface of the coenenchym is very rough, being in strong contrast with the surface of those species of Sarcophytum and Lobophytum I have examined, in which it is relatively smooth. It is very difficult in this genus to determine accurately the number of autozooids and siphonozooids in a given area as it is impossible to distinguish except in series of sections the young retracted autozooids from siphonozooids. The relative number of the two forms seems to vary in diffierent parts of the colony, the siphonozooids being apparently more numerous near the apex than in the neighbourhood of the stalk. At a distance of 30 mm. from the apex I counted in an area of 1 sq. cm. 12 autozooids, and 36 siphonozooids, and in another ⅔ sq. cm., 90 mm. from the apex, I counted only 5 autozooids and 13 siphonozooids. The arrangement of the polyps is, however, very irregular, the number in any given area depending very largely upon the condition in which the part was when the colony was killed. The only point as regards the arrangement of the polyp that can be used for systematic purposes is that the siphonozooids are relatively fewer than in the genera Sarcophytum and Lobophytum. We have not yet any very satisfactory statements of the average number of siphonozooids in these genera. In my sections, however, I find in a species of Lobophytum collected by Dr. Willey more than 40 siphonozooids to each autozooid; and, judging from the descriptions of Moseley, as well as from my own sections of the genus Sarcophytum, there must be in some parts of the colony at least as many as 25 siphonozooids to each autozooid. In Acrophytum there are rarely more than 4 or 5 siphonozooids to each autozooid.

The spicules of Acrophytum are found in a dense row in the superficial ectoderm of the coenenchym. They are very characteristically club-shaped (see Plate IV., B′), 0.25 mm. long by 0.1 mm. broad. Below the surface the coenenchym is almost entirely free from spicules, a very striking feature of the genus (or species ?) when it is compared with the two other dimorphic genera previously mentioned. There are no spicules in the exsert portion of the polyps.

Sex : The larger of the two forms is a female, the large brown eggs occurring in small numbers in the autozooid polyp tubes. They vary very considerably in size, the largest being oval in shape and nearly 2 mm. in greatest diameter. Judging from the character of the germinal vesicle, I am of opinion that the larger eggs are ready to be spawned , or, in other words, the specimen was sexually mature. The eggs of this species are the largest I have observed in any Alcyonarian. Moseley says, that in Sarcophytum the ova are 7 mm. in diameter, but having examined a few sections of the actual specimens described by him, I think this must be a misprint for 0.7 mm. In Alcyonium digitatum the ripe ova are only 0.5 mm. in diameter, and in nearly all Alcyonarians the ova are approximately the same size.

The smaller specimen is a male, the sperm sacs not being quite mature.

SARCOPHYTUM TROCHIFORME.

NEW SPECIES. PLATE III. C., VI. C.

Four of several specimens obtained when trawling in lat. 32° 53′ S., long. 28° 12′ E. (about 17 miles E. of East London), depth: 45 fathoms, bottom: sand and mud and corallines, were sent to me.

They are all top-shaped, the crown being rounded in outline and presenting no well-marked edge as in Sarcophytum. The stalk is, in the preserved specimens, variously wrinkled and varies considerably in the degree of attenuation it presents. The specimens are white, but there is a ring of bright red spicules round the base of the exsert portions of the polyps, and the spicules of the tentacles and the body wall of the exsert portions of the polyps are bright yellow.

Numerous siphonozooids are crowded between the autozooids, the mouth of each one opening in a small convex protuberance. Owing to this protuberance and their relatively large size the siphonozooids are much more conspicuous than those of other species of the genus.

The specimen (IV.) I dissected was 10 mm. in length, 6.5 mm. in diameter at the widest part of the crown, and 3.5 mm. at the narrowest part of the stalk. The corresponding measurements of the other three were : (I.) 38, 15, 5 ; (II.) 10, 6, 4 ; and (III.) 21, 4, 1.5. No. II. is characterised by having a short broad stalk, No. III. by having a very long and slender stalk.

The yellow spicules which occur in abundance in the tentacles are rods with rather swollen extremities covered with warts (Plate VI., C″) .05 mm. in length, by .015 mm. in breadth. The body walls of the autozooids are strengthened by long warted spindle-shaped spicules of various sizes up to a maximum of about .15 mm. in length by .025 in breadth (Plate VI., C′). The red spicules at the base of the retractile portion of the autozooids are double clubs with a very short connecting bar .03 mm. in length, .02 mm. in breadth (C). The other spicules, which are densely packed in the superficial parts of the coenenchym, are of the same shape and size as these spicules.

This species differs from all the known species of Sarcophytum in several characters, of which the more important are :—The constriction of the base, the colour of the spicules, of the tentacles, and of the coenenchym round the autozooids, the small size of the spicules (*i.e.*, about one-tenth the length of the average of Sarcophytum spicules), and the relatively large size and prominence of the siphonozooids.

SUB-ORDER GORGONACEA.

One of the most difficult points in the morphology and classification of the Alcyonaria is the determination of a satisfactory boundary between the Alcyonacea and the Gorgonacea. The present system is certainly not satisfactory, but as an improved one must depend upon the results of a series of observations which are not yet completed I have decided to adhere to it in this paper.

I have very little doubt that the genera Gorgonia, Juncella, Eunicella, Villogorgia, and Primnoisis are rightly included in the sub-order Gorgonacea, but I have considerable hesitation in separating Spongioderma and Melitodes from genera which are usually included in the Alcyonacea.

FAM.: BRIAREIDAE.

Spongioderma verrucosum Möb.

Two specimens were sent to me obtained off Algoa Bay, close to Rij Bank, long. 25° 51′ 30″ E., lat 33° 58′ S. Depth: 25 fathoms. Bottom: dark sand with black specks.

This species was first described and figured in 1862 by Möbius under the name Solanderia verrucosa. His specimen was obtained in Algoa Bay. In 1866, Gray, who overlooked Möbius's paper, gave a short description of a specimen obtained near the Cape of Good Hope for the British Museum, under the name Homophyton gattyiae. Three or four years later Kölliker made a careful investigation of the specimens attributed to the genus Solanderia, and discovered that the specimen for which this name was first proposed was a sponge. He therefore proposed to abandon the name Solanderia from the group of Alcyonaria altogether, and in so doing changed the name of the Cape species to Spongioderma verrucosum.

One of the specimens sent to me is an unbranched fragment, about 200 mm. in length and 5 mm. in diameter. The coenenchym is bright red in colour, and the moderately prominent verrucae yellow. The greater part of the fragment is covered with a thin coating of a sponge belonging to the genus Esperella, only the yellow verrucae projecting through it. This sponge is described as being like " mucilage " when fresh. It is interesting to note that the specimen described by Möbius was also covered with this same sponge.

It is not necessary to give in this place in detail the general characters of the species ; but as a point of systematic interest, attention may be called to the very great variety of form and colour presented by its spicules.

Some of them are figured in the paper by Möbius, but no attempt is made to state in words the form of the spicules. Apart from the fact that they are all, or nearly all, profusely ornamented with blunt papilliform processes, they have no characteristic feature. There are spheres, rods, spindles, plates, tripods, crosses, etc., etc., varying in size from 0.2 mm. in greatest length to less than .03 mm. in diameter. In colour every variety of tint may be found of yellow, pink and red ; and many spicules appear when seen singly to be quite colourless.

I can find no evidence of sexual organs in this specimen.

Another fragment collected in the same haul is 220 mm. high, and consists of a piece of main branch (?) and three branchlets. It differs from the type specimen in having the verrucae of a red instead of a yellow colour, but the coenenchym is encrusted with the same species of sponge.

FAM.: MELITODIDAE.

MELITODES DICHOTOMA, PALLAS. PLATES I., II., AND VI., B.

Three specimens were sent to me, which I believe belong to the species called by Pallas Isis dichotoma, and amended by Wright and Studer to Melitodes dichotoma.

The following notes were attached :—

" No. 2.—Yellow Alcyonarian (original colour) well pre-
" served, procured by large trawl in False Bay, lat. 34°
" 19′ 15″ S.; long. 18° 36′ 30″ E., over 8.35 p.m.—
" 9.40 p.m. About half-a-dozen pieces procured, 27th Sep-
" tember, 1898. This is not nearly so abundant as No. 1
" (Gorgonia flammea), only one other specimen having been
" got as yet, badly preserved.
" No. 3.—Red specimen, got at the same time and place
" and in same abundance ; badly preserved.
" No. 5.—Specimen same as No. 2, but probably better
" preserved."

It is interesting to note in this place that the red specimen No. 3 turns out to be the best preserved specimen of an Alcyonarian, that has been sent to me from abroad. It is true that the polyps are not fully expanded, but the details of the histology are almost perfect.

The very striking difference in colour between the yellow form Nos. 2 and 5 and the red form No. 3 suggest that we are dealing with two distinct species, but the study of the hard and soft parts shows that, except colour, there are no characters which separate the two forms (Plates I. and II.).

It is well known that in the Alcyonarians the colour of the spicules (and the colour of all preserved specimens is chiefly due to the colour of the spicules) is a very uncertain and variable character. Von Koch (3) gives a very beautiful example of this in Muricea chamaeleon, in which yellow and red varieties occur, and one specimen which he figures is partly yellow and partly red.

The fact that the yellow and red varieties of Melitodes dichotoma were taken in the trawl at the same time and place only confirms the opinion gained by the study of anatomy that they are not distinct species. It is quite probable that when this ground is again dredged piebald varieties will also be found. I was particularly pleased to find among the Cape Alcyonaria these specimens of the genus Melitodes, because it is the only genus of Gorgonacea in which dimorphism of the polyps has been described (Ridley, 14). Ridley's specimens of Melitodes albitincta were not preserved in spirit, and I had some doubt at the time his paper was published whether the examination of dried specimens was sufficient to prove the existence of true dimorphism. In the yellow variety from the Cape it may be clearly demonstrated that the polyps on the terminal branches are not all of the same size, and a condition very similar to that figured by Ridley would doubtless be produced in dried and contracted specimens (Plate VI., B). An examination of sections, however, proves that the larger and smaller polyps do not differ in any essential respects. The small polyps possess eight tentacles and eight mesenteries similar to those of the larger ones of the colony, and there can be no doubt that they are simply undeveloped polyps of the ordinary kind.

It seems to me, then, that we are justified in saying that dimorphism has not yet been observed in the Gorgonacea.

Neither the yellow nor the red variety exhibit sexual cells very far advanced towards maturity ; but the presence of one or two young egg cells in the latter prove it to be a female. The sex of the former I have not at present been able to determine.

As these specimens were obtained in September it would be interesting to examine specimens found in March and April, when they would probably be approaching sexual maturity.

FAM.: GORGONIDAE.

GORGONIA FLAMMEA. Ellis and Solander.

PLATE V., B.

The genus Lophogorgia was founded by Milne Edwards for Gorgonia palma (Esper), which was afterwards called Gorgonia flammea by Ellis and Solander. Neither Kölliker nor Verrill accepted the new generic name, the former including it in the genus Gorgonia and the latter in the genus Leptogorgia. Wright and Studer, however, have more recently revived the genus Lophogorgia, but on what appear to me to be insufficient grounds. The only character which distinguishes it from other Gorgonidae is that the axis is somewhat flattened, *i.e.*, it is oval instead of round in section. This character, however, is a very variable one. The younger branches of a large specimen have the axis round in section, and it is as a rule only in the main stems that the flattening of the axis is seen in a marked degree. Moreover, a considerable flattening of the axis is often seen in other Gorgonias of a fan-shaped habit of growth.

There may be a difference of opinion about the desirability of dividing up the old genera and recognising a large number of generic names in place of them; but, in my opinion, the flatness or roundness of the axis standing by itself is not a character which can be considered of more than specific value, and there may indeed be some doubt as to its value in distinguishing species.

I am inclined, then, to agree with Kölliker, who includes all species in which the horny axis is not strengthened by secretions of calcium carbonate in the genus Gorgonia. In adopting Kölliker's view as to the generic name, a difficulty arises regarding the specific name. There is no doubt that if we followed strictly the rules of precedence that Kölliker's plan would be adopted of calling it Gorgonia palma Esp., but, as pointed out by Wright and Studer, this leads to confusion with Gorgonia palma Pall., which is very different in many respects. The term "palma," moreover, does not convey an acurate idea of any characteristic feature of the species. Ellis and Solander's term "flammea" does call attention to the bright red colour which characterises most of the known specimens, and therefore I think it is best called Gorgonia flammea E. and S. The spicules of the coenenchym are of the shape known as double spindles. Their average length is about .07 mm. but they vary from 0.1 mm. —0.05 mm. in length.

Two specimens, obtained in the dredge between Seal Island and Mossel Bay, at a depth of 5 fathoms, were sent to me. Mr. Gilchrist informs me that "this Alcyonarian has been found in abundance in False Bay and Mossel Bay, and I think occurs all along the shore. I have seen a dried specimen about 4 feet high." These specimens were collected on the 29th of June.

Another specimen of the same species dredged on November 1st, close to the Rij Bank, Algoa Bay, at a depth of 25 fathoms, was sent to me later.

None of these specimens showed any sexual organs. These facts suggest that the spawning period of the species is probably in the spring or early summer.

GORGONIA CAPENSIS, n. sp.
PLATE V. A.

A beautiful yellow Gorgonia, obtained in 40 fathoms 10 miles S.W.¼W. of Cape St. Blaize, differs in several essential respects from any species that has yet been described.

Description.—The specimen is 250 mm. in length, the base missing. The branches are not disposed in one plane. Terminal branches elongated. Main axis 2 mm. in diameter. Branches 1 mm. in diameter terminating bluntly. Axis and branches cylindrical in form. Surface smooth, the delicate transparent polyps projecting from narrow bi-convex slits without forming verrucae. The spicules of the coenenchym are warty spindles of the general form of those described by Kölliker as "doppelspindeln," on an average 0.1 mm. in length.

The polyps are scattered evenly over all sides of the branches. Over the older branches the coenenchym is thin, but the terminal branches are relatively fleshy.

There can be little doubt that this species is closely related to Gorgonia (Lophogorgia) Lütkeni Wright and Studer which was found in 310 fathoms off Prince Edward Island, 960 miles from the Cape.

It differs from Wright and Studer's species in the following particulars :—The axis is cylindrical and not appreciably flattened, the polyps are evenly scattered in the coenenchym, leaving no bare lines or patches, the spindles are decidedly smaller (the spicules of G. Lütkeni being 0.2 mm. and 0.3 mm. in length) *. In the shape of the spicules there is a very striking resemblance between these two species and Gorgonia flammea.

In many particulars in which this new species differs from G. Lütkeni and G. flammea it approaches those species of the genus which were formerly grouped under the generic name of Leptogorgia.

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* Since writing this I have examined a piece of the type specimen of G. Lütkeni from the British Museum and find them the same size as in G. capensis but red in colour like flammea. Not one was as much as 0·2 mm. in length.

On making a series of sections through a branch in order to compare the general anatomy of this species with that of Gorgonia flammea, I was surprised to find numerous oval bodies, the largest of which were 1 by 0.8 mm. in size, situated in what appeared to be special sacs in the coenenchym. These bodies proved to be embryos, and each one lies in a special enlargement of one of the intermesenterial spaces of a polyp.

In most cases there is only one embryo to each polyp but not unfrequently there are two. There are very few barren polyps, except at the ends of the branches, and as some of the pregnant polyps are killed expanded and in all cases their tissues are in a healthy state, there is no reason to suppose that the digestive function is interfered with by the embryo. There is certainly no evidence of dimorphism such as occurs in Paragorgia, in which the siphonozoids produce the gonads and the autozooids are sterile.

It is interesting to speculate on the mode of discharge of these embryos. As the mouth of the polyp can not be more than 0.01 mm. in length, *i.e*,, one-hundreth part of the length of the embryo, it is improbable that they are discharged by the mouth after the manner of the ova of other Alcyonaria. I have observed that in the older branches of the specimen the crust of coenenchym covering the axis has a longitudinal split of considerable length, and that below this the coenenchym is thin and without embryos. It seems to me, then, to be possible that the coenenchym is actually ruptured from time to time to allow the escape of the embryos, and is afterwards regenerated.

The principal interest of the specimen, however, is that it affords a rare instance of viviparity among the Alcyonarians. There is a figure in Kölliker's Icones XIV 3 of Gorgonia (Pterogorgia) pinnata, in which the polyp cavity is shown in section to be divided by a septum into two compartments, and this figure reminds me very forcibly of some of the sections in my series which were cut through the brood chamber without actualy touching the embryo. There is no mention in the text, however, of any embryos, and it is possible that this second chamber in Kölliker's figure has some other meaning [*].

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[*] Lacaze Duthiers (1) proved the precious coral to be viviparous, and according to Marion and Kowalewsky the "Clavulaires petricoles" are viviparous, but the "Clavulaires des Posidonies" are oviparous. Sympodium (Alcyonium) coralloides is also according to these authors viviparous. Koren and Daniellsen (8) state that three species of Nepthya found at depths of 269-761 fathoms are viviparous. These are, I believe, the only authenticated cases of viviparity among Alcyonarians hitherto recorded. Gorgonia capensis affords the first instance of viviparity that I have come across in my studies of Alcyonarians.

In adition to the embryos I have found in the polyp cavities a few ova. These are on an average 0.12 mm. in diameter. I cannot tell in what stage they are, but judging from the nucleus alone it appears probable that they are nearly mature. On searching through a great many sections I can find no trace of any intermediate stages between these immature ova and the sterrula larvae.

As regards the anatomy of the polyps, all that can be said at present is that there is a very long stomodaeum, which bears on the ventral side a well marked siphonoglyph.

The specimen was dredged on June 8th, 1898,—that is, three weeks earlier than the specimens of Gorgonia flammea. The facts of the sexuality of the genus so far ascertained suggest one or two inquiries for those who have the opportunity of working in the same field. It would be interesting to know if the phenomenon of viviparity is peculiar to Gorgonia capensis which has hitherto been found only at a depth of 40 fathoms, and whether the time of sexual maturity of the two species is, as the facts suggest, the early weeks of June. It is also very desirable to determine the character and history of the eggs of Gorgonia flammea.

FAM.: GORGONELLIDAE.

JUNCELLA ELONGATA (PALLAS). PLATE V. D.

Owing to the very imperfect state of our knowledge of the Juncella group of Alcyonarians, I have considerable hesitation in naming the two specimens of the genus sent to me from the Cape. The specimens are 250 mm. and 300 mm. in length respectively, the larger branching dichotomously into seven branches, the longest unbranched free end being 150 mm. in length.

Both specimens are imperfect, the base being wanting. The thickest part of the stem is 7 mm. in diameter, and the branches terminate bluntly with an apical diameter of 3 mm.

In the parts of the branches with a diameter of 4 mm. the diameter of the axis is 2 mm.

The surface of the coenenchym is almost smooth, but in the smaller specimen there are slight verruciform projections. In the fragment of the stem of the larger specimen there are faint spiral lines.

One of the most characteristic features of the specimen is the great preponderance of triple-star spicules (Plate V. D) 0.07 mm. in length, but there are also many spicules of the shapes known as double stars, warted spindles, etc. There are very few spicules of the club-shape which are so characteristic of the species J. juncea and J. gemmacea (Kölliker).

The colour of the specimens is deep red.

They were dredged at Rij Bank on November 1st at a depth of 25 fathoms. For further particulars of this locality see Alcyonium pachyclados, p. 72.

The larger specimen is a female containing a few ova, which are oval in shape, with a maximum diameter of no less than 1 mm., *i.e.*, twice as large as the ova of Alcyonium digitatum. Judging from the condition of the nucleus I believe the ova are ready to be spawned

FAM.: PLEXAURIDAE.

EUNICELLA PAPILLOSA. (ESP.) PLATE V. C.

A single complete specimen of this species was sent to me. It can be easily recognised by the very characteristic torch-like spicules .08 mm. in length (Plate V. C.) which crowd the superficial covering of the coenenchym. The coenenchym is partly covered by a thin layer of the same sponge which encrusts Spongioderma. I can find no sexual organs in the specimen which was dredged at Rij Bank in 25 fathoms of water. (See Alcyonium pachyclados, p. 72.)

FAM.: PRIMNOIDAE.

PRIMNOISIS CAPENSIS (STUDER). PLATE VI. AA'.

This species was described by Studer under the name Isidella capensis, but was afterwards transferred to the genus Primnoisis (19). Studer's specimens were obtained in 50 fathoms, in lat. 33° 59′ S., and long. 17° 52′ E.

The single specimen sent to me from the Cape was obtained at Rij Bank (see Alcyonium pachyclados, p 72), 33° 58′ S., and 22° 51′ E., in 25 fathoms of water. It is 40 mm. high, branching dichotomously in one plane to form seven branchlets. The base is wanting. The thickness of the stem and branches is uniform and about 1 mm. in diameter. The colour is pale pink. The spicules are warty clubs and spindles about 0.2 mm. in length. There are no signs of any sexual organs.

FAM.: MURICEIDAE.

VILLOGORGIA MAURITIENSIS (RIDLEY).

This beautiful specimen was one of two obtained by the dredge off East London, January 28th, 1898, lat. 33° 6′ 30″ S., long. 28° 11′ E., at a depth of 85 fathoms.

The species was originally described by Ridley from a dried specimen obtained by Mr. de Robillard off Mauritius, from a depth of 80 fathoms. Allowing for the difference between well-preserved specimens in spirits and dried specimens, the resemblance of our specimen with the description of the type are sufficient to justify its inclusion in the species. The specimen is 200 mm. high, branching in one plane with an expanse of about 170 mm. The spicules are very irregular in size and shape. No sexual organs were discovered.

SUB-ORDER PENNATULACEA.

FAM.: VIRGULARIDAE.

VIRGULARIA REINWARDTI. (HERKLOTS.)

Two incomplete specimens of a species of Virgularia were sent to me which approach most closely to the description given of Virgularia reinwardti of Herklots by Kölliker, but in the absence of the basal part it is impossible to say for certain if they agree in all particulars with the type specimen.

Considerable interest attaches to these specimens, as the only Pennatulid which has hitherto been recorded from South African waters is the type specimen of Halisceptrum gustavianum var. parvifolia in the Stockholm Museum, which was found at Port Natal. The genus Halisceptrum approaches closely some of the species of Virgularia, and it may be a matter of some doubt whether these specimens are rightly referred to Virgularia or Halisceptrum.

For reasons which, in my opinion, are sufficient I propose to refer them to the species Virgularia reinwardti. The fragments are approximately of the same size, the larger being 126 mm. in length, 9 mm. in diameter at the widest part, with a bare ventral side 2 mm. in breadth. The length of Kölliker's specimen 3 was 178 mm., of which 43 was taken by the stalk, which is absent in our specimens, so that it is probable that in life they were of about the same length. The breadth of the plume at the widest part was in Kölliker's specimen No. 3, 3½ mm. There is so much difference in the thickness of Pennatulids, however, according to the method in which they have been killed and preserved, that I do not think this difference between our specimens and Kölliker's No. 3 should be regarded as one of very serious importance.

The arrangement of the siphonozooids in our specimens is the crucial point upon which my opinion is based that they should be referred to the species V. Reinwardti. Virgularia reinwardti is the only species in which the siphonozoids occur in a row on the leaves—one siphonozoid to each autozooid (7). The other species of the genus have a very different arrangement of the siphonozooids. There is one point of difference, however, between our specimens and the type. Kölliker describes and figures one isolated siphonozooid on the bare part of the axis at the margin of each leaf. "Zooide laterale je Eine Reihe zwischen zwei Blättern bildend von denen ventral je ein Zooid noch auf den Kiel ubergeht." This isolated zooid I cannot find in the Cape specimens.

Our specimens agree with the type in bearing 18 autozooids in each of the leaves I have examined.

They were obtained in the dredge on 3rd March, 1899, in St. Francis Bay, lat. 34° 2′ 20″ S., long. 25° 11′ 45″ E. Depth: 30 fathoms.

No sexual organs were observed in the specimen.

CAVERNULARIA ELEGANS (HERKLOTS, sp.).

I have found considerable difficulty in the determination of this species. At first I thought it must be Veretillum Australasiae of Gray. The figure given by Gray, although very poor and drawn from a badly preserved specimen, showed some characters in common with the Cape specimen. It is, I believe, the only one of the club-shaped Pennatulids in which the rachis is figured and described as being so much as six times the length of the stalk. In some respects, too, it appears to be closely allied to Herklot's Sarcobelemnon elegans from Japan, the name of which was changed by Richiardi to Veretillum elegans, and by Kölliker to Cavernularia elegans, having apparently no axis and presenting on the surface quadrangular markings similar to those in Herklots' original figure.

The proportionate length of the rachis is, however, much less in Herklot's species than in our specimen A ; but I am not inclined to regard it as being distinct.

There can be no doubt that it belongs to Kölliker's family Veretilleae, the polyps being evenly distributed round the rachis and the " sarcosoma " abundant ; there can also be no doubt that it belongs to the same author's Cavernularidae as the spicules of the axis are long rods, and to his genus Cavernularia, as there are no spicules in the polyps, and no axis. Of the two species of Cavernularia mentioned by Kölliker which have no axis, it clearly comes nearer to C. elegans than to the very variable and widely-distributed C. obesa, the spicules of the rachis being almost entirely superficial.

Specimen A.

This specimen was obtained in False Bay at a depth of about 25 fathoms.

Total length..	..	..	145 mm.
Length of Rachis	..	..	120 mm.
„ of Stalk	..	..	25 mm.
Greatest diameter	..	..	23 mm.

There is immense variety in the size and shape of the spicules. The longest of the rod-like spicules which crowd the superficial parts of the rachis are about 0.3 mm. long by .045 broad, the oval and hour glass-shaped spicules which occur both in the rachis and the stalk are 0.1 mm. in length to .035 mm. in breadth, the otolith-like bodies of the stalk are from tiny specks to .015 mm. in diameter. The long rod-like bodies are of a pale pinkish-brown colour, the others colourless. The autozooids are 10 mm. in length, the tentacles 3 mm. in length.

These measurements are taken from a single beautifully-expanded polyp that was sent separately with the following note :—“ This specimen ”—(*i.e.*, the one I have described)—“ could not be got to expand, but another (the only other found) expanded beautifully, and with the aid of chloral hydrate was killed in this condition, some of the polyps projecting half an inch.”

Some of the autozooids on the specimen sent to me were partly expanded, and I have been able to study their anatomy fairly satisfactorily, but the single autozooid of the expanded colony that was not sent to me is a most beautiful object and, I imagine, quite as fully expanded as in the living condition. The most noteworthy feature is the extraordinary length of the Stomodaeum. It extends from the mouth to a very short distance from the base of the expansible part of the autozooid, *i.e.*, about 9 mm. It appears, therefore, to be a much longer stomodaeum than occurs in the Pennatulids which have hitherto been described. It must be remembered, however, that all or nearly all the descriptions of Pennatulid anatomy that have hitherto been published have been based on specimens that were in all probability contracted, and the measurements of length of the parts of the polyps are not to be relied on. The autozooids of the specimen sent to me, although “‘ expanded,” that is to say, not withdrawn below the surface of the Sarcosoma and with their tentacles free, were clearly diminished in volume by muscular tetanus before being killed. They are quite opaque and altogether different ent in appearance from the expanded autozooid that was sent to me separately. Although the stomodaeum of the autozooid of this Cavernularia is, therefore, a long one compared with that of most Alcyonaria, it is doubtful if this is a character which separates it from the other species of the genus or indeed from other Pennatulids allied to it.

The long rod-like spicules give to the sarcosoma of this form a pale pink colour. Without giving too much prominence to colour as a feature in the diagnosis of species, attention may be called to the fact that no mention of any colours has been made in the description I have read of the other species of Cavernularia, and the specimens I have had the opportunity of examining have all been perfectly white, with the exception of one specimen in the British Museum and the specimens from the Cape described below.

Specimen B.

A smaller specimen obtained in the trawl off Robben Island has a very different appearance. It is much more contracted and wrinkled on the surface. It has none of the pinkish colour noticed in Specimen A, and when cut with a knife seems to be much tougher in consistency. A superficial examination would suggest that this specimen belongs to a different species to Specimen A, but the spicules present the same characters, there is no trace of an axis, and the septa are arranged in a corresponding manner in the two specimens. This specimen, indeed, presents no characters except possibly the proportional length of the rachis, which cannot be accounted for on the supposition that it is very much contracted.

The measurements are of

	Specimen B.	Cavernularia elegans Herklots.
Total length	.. 77 mm.	95 mm.
Rachis ..	.. 51 ,,	66 ,,
Stalk ..	.. 26 ,,	29 ,,
Greatest Breadth	.. 13 ,,	14 ,,

On comparing this specimen with the description of Cavernularia elegans (Herklots) from Japan, it will be noticed that the proportions are almost identical, and there can be no doubt that it belongs to the same species. The only question that is open to doubt is whether our specimens A and B belong to the same species, and, as I have just pointed out, the only character of importance in which they differ from one another is the proportional length of the rachis. It is a well-known fact that the stalk of some Pennatulids is capable of very considerable changes in length and breadth during life; we know that the rachis of some Pennatulids shrivels very considerably when brought on to the deck from a trawl, but we have no written information at present about the degree of expansion and contraction that the rachis of Cavernularia can exhibit. Judging alone from the structure of the sarcosoma, it is very probable that the rachis is in the living specimens in their normal habitât very much larger than in the best spirit specimens. It may be, then, that the greater length of the rachis in Specimen A may partly be due to its having been killed in a somewhat less contracted condition than Specimen B. It may also be partly due to Specimen A being a larger and therefore an older specimen, the rachis becoming proportionately longer in older specimens as in many other Pennatulids.

My conclusion, therefore, is that these specimens are probably examples of the same species, and that they should be identified with Cavernularia elegans (Herklots).

Specimen B was a female with ova 0.5 mm. in diameter. It was obtained on November 20th, 1897.

CAVERNULARIA OBESA (VAL.) (Variety).

PLATE III., A and B.

Eight specimens out of fifteen obtained on November 19th, 1898, near Port Alfred, lat. 33° 44′ 20″ S., long. 26° 44′ 20″ E., depth 40-43 fathoms, were sent to me.

I consider them to be varieties of the very variable and widely-distributed species Cavernularia obesa (Val).

Two of the specimens are white, four have a purple rachis with a yellow stalk, one is yellow, and one very small one has a pink rachis and pale yellow stalk.

The largest one is purple, 58 mm. in total length and about 6 mm. in greatest diameter, the stalk being 16 mm. in length. Other specimens are 40 mm., 38 mm., 26 mm., in length.

The polyps, which in some of the specimens are beautifully expanded, are colourless, bearing no spicules. There is no axis. Two specimens were dissected, one of them, purple in colour, was male, the other yellow and female.

These very interesting and important little Pennatulids are worthy of further investigation. They appear to be dwarf varieties of a species which has a wide distribution in the Indian and Malay seas. The only specimen which at all resembles them that I have seen is one in the British Museum presented by Dr. Gwyn Jeffreys, and labelled Cavernularia obesa, var., 40 fathoms Korean Strait. It is orange colour. I hope to be able to find time soon to investigate the anatomy of these species more fully.

HYDROCORALLINAE.

ALLOPORA NOBILIS. Saville Kent.

A fragment of a dried skeleton, 5 inches in height and 2 inches in diameter at the base, was sent to me, together with a smaller fragment preserved in formalin. It is probably identical with Allopora nobilis Saville Kent (15). The specimen Kent described is in the British Museum, but the locality from which it was obtained is not recorded.

The specimen under examination was obtained in the trawl in False Bay at a depth of 30 fathoms. The interesting statement is made in the notes sent to me that "there are evidently large beds, as when the trawl gets on them it is ruined owing to the number of holes torn in it."

Moseley (Phil. Trans., 1878, p. 480) considered that this species was probably identical with Verrill's Allopora venusta from Neah Bay, Washington Territory (17). In both the colour is light red and the branches yellowish at the tips, but the other characters upon which the species are founded are so very variable that it is difficult to express a definite opinion on the point without a careful examination of both type specimens. The discovery, however, that Allopora nobilis occurs at the Cape of Good Hope suggests that the species are distinct. If they are identical the geographical distribution of the species is remarkable.

An examination of sections through the soft parts shows that the specimen is a female. There is not sufficient material, however, for me to make a satisfactory study of the gonophores of this species.

As Moseley pointed out, it is not easy to distinguish the genus Allopora from the genus Stylaster. It is possible that there is a difference between them in the general characters of the male and female trophodiscs, and, consequently, it is very desirable that as many examples as possible of the two genera should be studied, with the object of discovering whether such a general distinction does exist. I have compared my sections of this species of Allopora with those I made some years ago of Allopora from Norway, and can find no essential points of difference between them. The only Stylaster that I have had an opportunity of examining was a Stylaster gracilis (female) from Torres Straits. This is a very slender form, but it agrees in general features with Allopora.

The verdict, then, on the identity of Allopora and Stylaster must be "not proven," but I would take this opportunity of pointing out that it is male specimens of Stylaster well preserved in spirit that are wanted to settle this interesting point.

This is the only specimen of the Hydrocoralline sent to me from the Cape, and it may be identical with the specimen obtained by the *Gazelle* which Studer considered to belong to the species Allopora oculina of Ehrenberg.

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DESCRIPTION OF THE PLATES.

Plates I. and II. Two specimens of Melitodes dichotoma (Pall.) to show the variation in the colour due to spicules in the species.

Plate III. Figs. A and B. Two specimens of the Cape variety of Cavernularia obesa × two diam. to show two examples of the great variability in colour exhibited by this species.

Fig. C. Sarcophytum trochiforme (n.s.) × three diam., a remarkable dwarf species of the genus.

Plate IV. Fig. A. Alcyonium antarcticum (W. and S.) × 3.

Fig A′. Two examples of the spicules of A. antarcticum, the one to the right × 150, the one to the left × 300.

Fig. B. Acrophytum claviger (n.g.) slightly enlarged.

Fig. B′. Club-shaped spicule of A. claviger × 160.

Fig. C. Heteroxenia capensis (n. sp.) slightly enlarged. The stalk is covered with an encrusting growth of the Tunicate Leptoclinum speciosum (Herdman).

Plate V. Fig. A. Gorgonia capensis (n.s.) × 2.

Fig. A′. A fragment of a branch × 20, to show the aspect of the verrucâe and the relative proportions of axis and coenenchym.

Fig. A″. Longitudinal section through a portion of a branch showing the embryos (e) in situ ; a. axis ; p. polyps.

Fig. A‴. Spicule of G. capensis × 400.

Fig. B. Two spicules of Gorgonia flammea (E. and S.) × 250.

Fig. C. Spicule of Eunicella papillosa Esp. × 350.

Fig. D. Triradiate spicule of Juncella elongata (Val.) × 100.

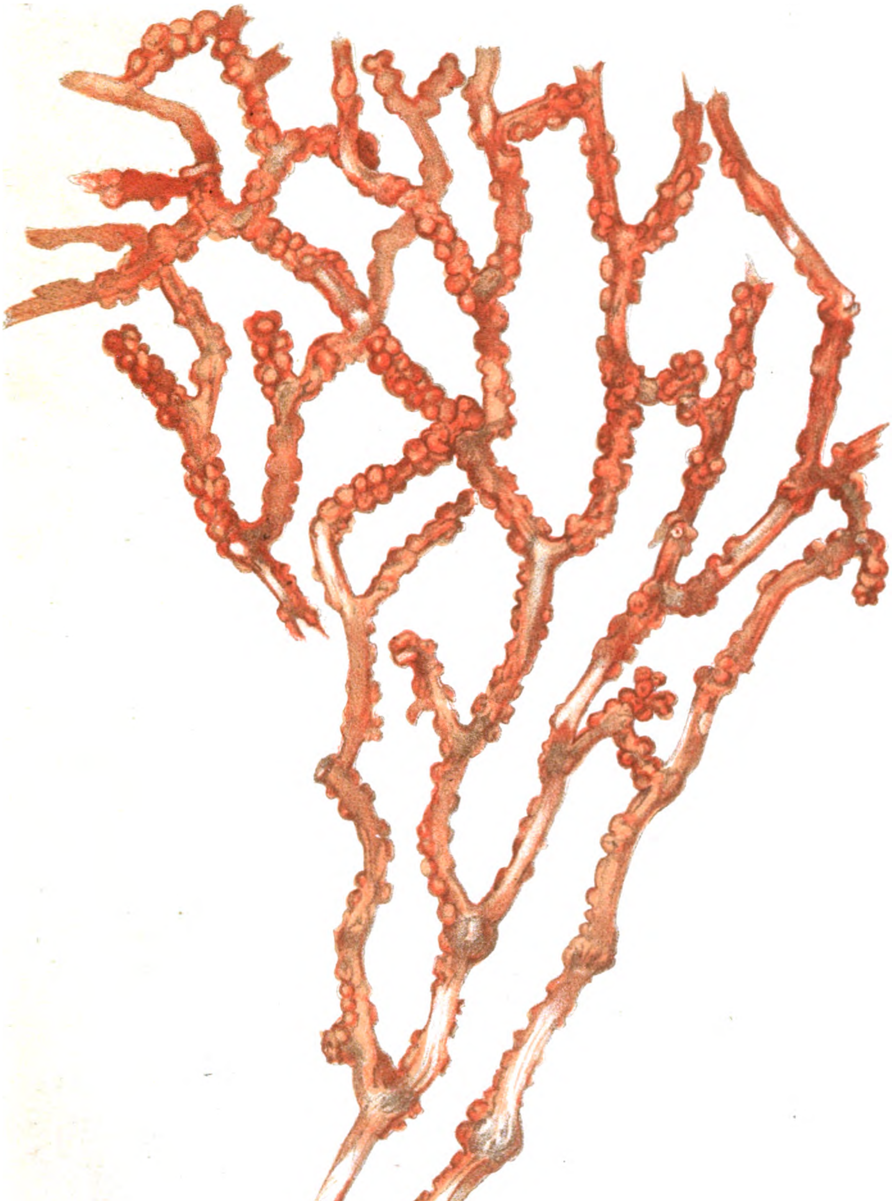
Plate VI. Fig. A. Fragment of Primnoisis capensis (Studer) slightly enlarged.

Fig. A′. The same × 17, to show the general appearance of the surface of the coenenchym and the arrangement of the spicules on polyps.

Fig. B. A piece of a terminal branch of Melitodes dichotoma considerably enlarged, to show the form and arrangement of the young polyps.

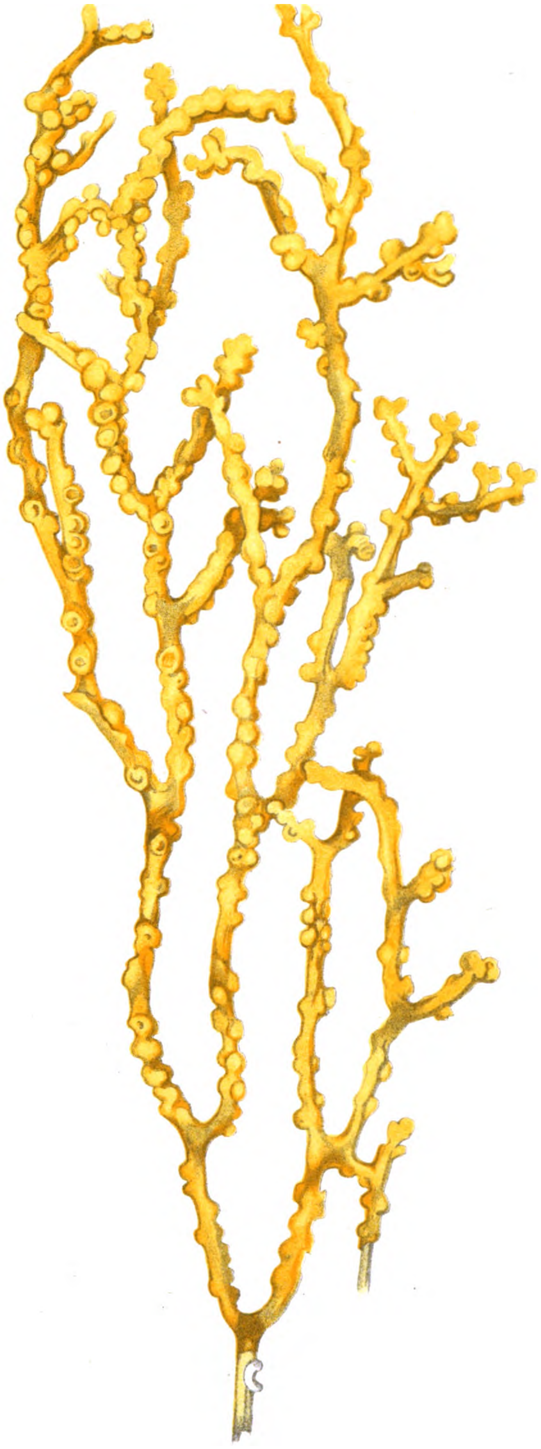
Figs. C, C′, and C″. Spicules of Sarcophytum trochiforme. C × 660, C′ × 340, C″ × 560.

[*Published 20th October*, 1900.]



Melitodes dichotoma. (Pallas)
Red variety.

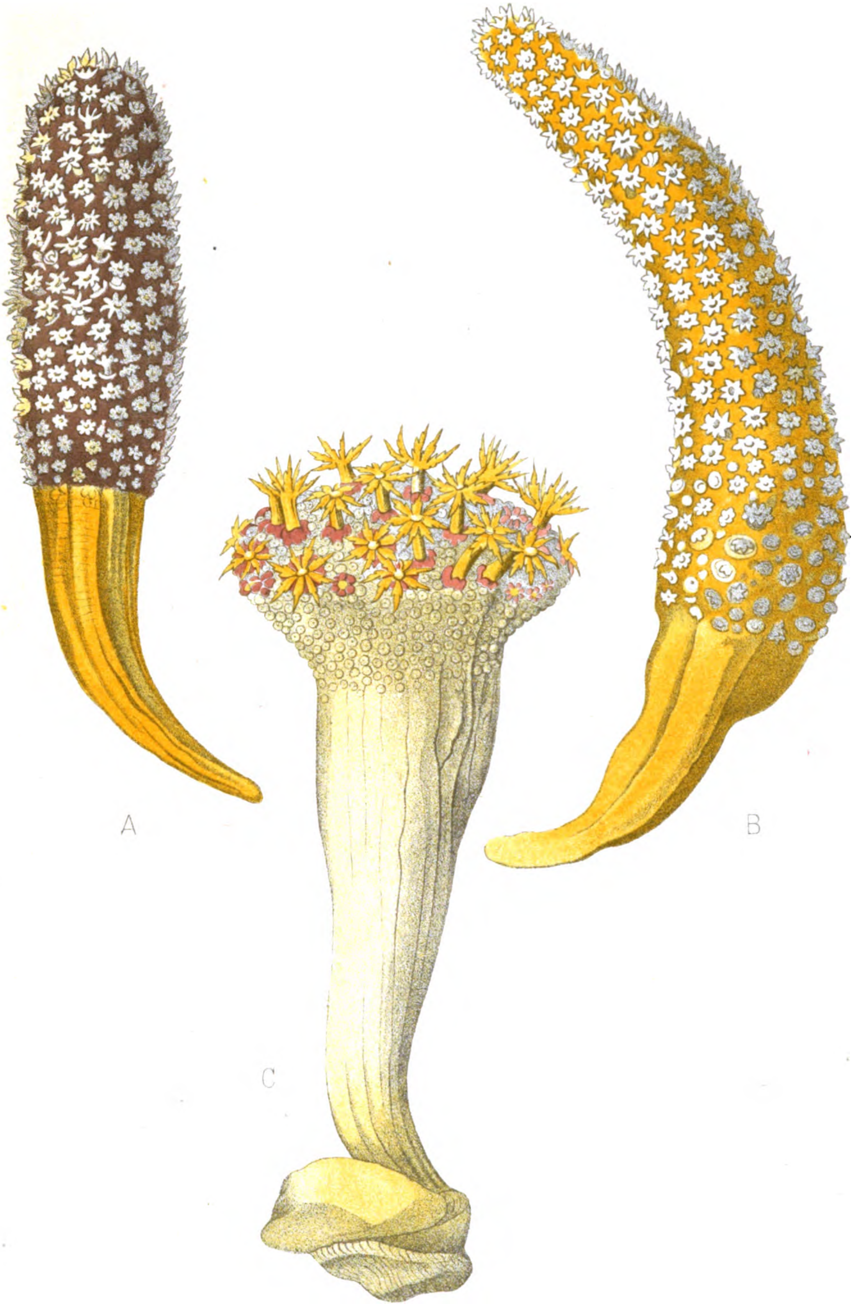
[illegible]



Melitodes dichotoma. (Pallas)
Yellow variety

Edwin Wilson Cambr. lith.

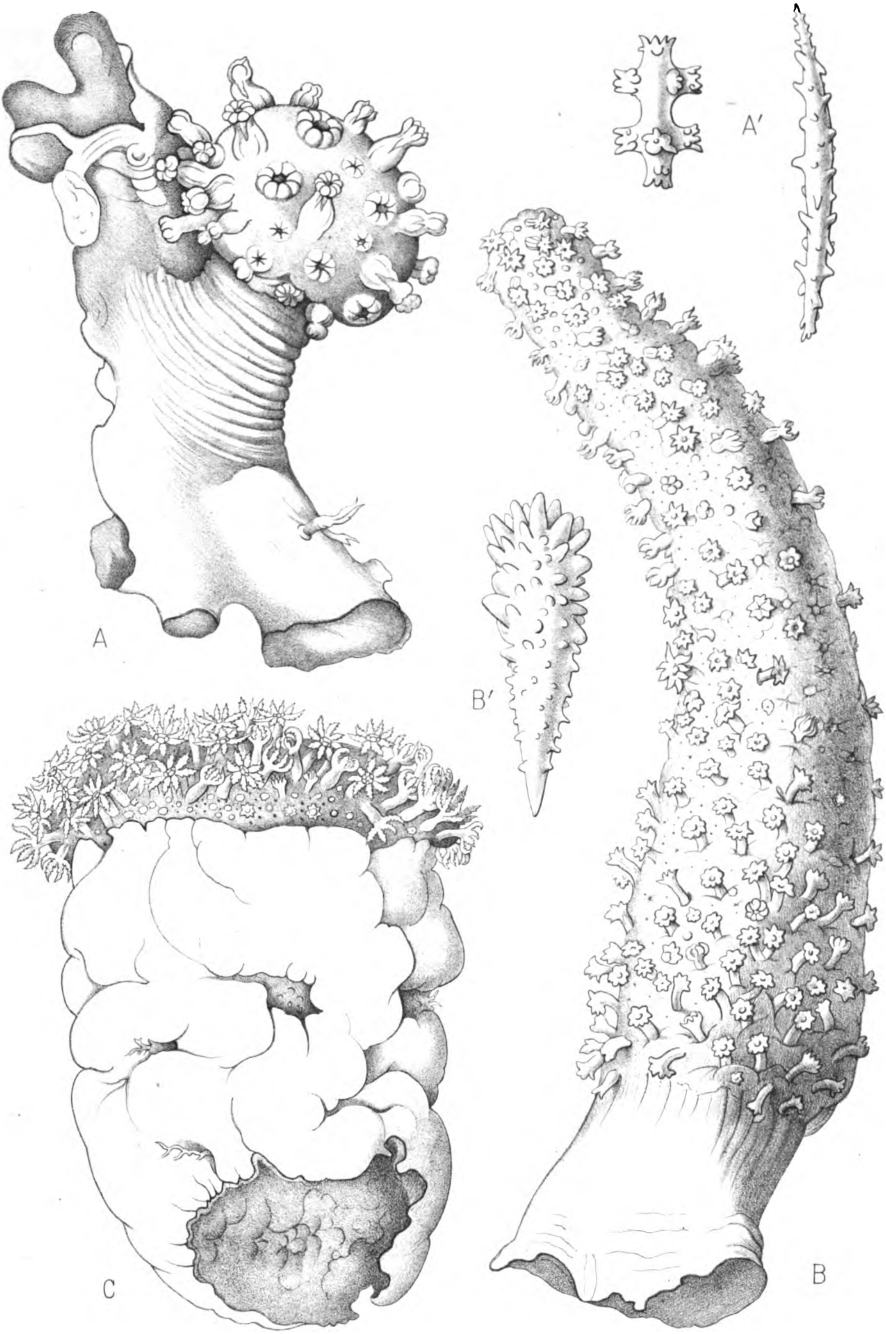
CAPE ALCYONARIA. PLATE III.



A. Cavernularia obesa Variety.
B. Cavernularia obesa, Yellow variety
C. Sarcophytum trochiforme Nov. spec.

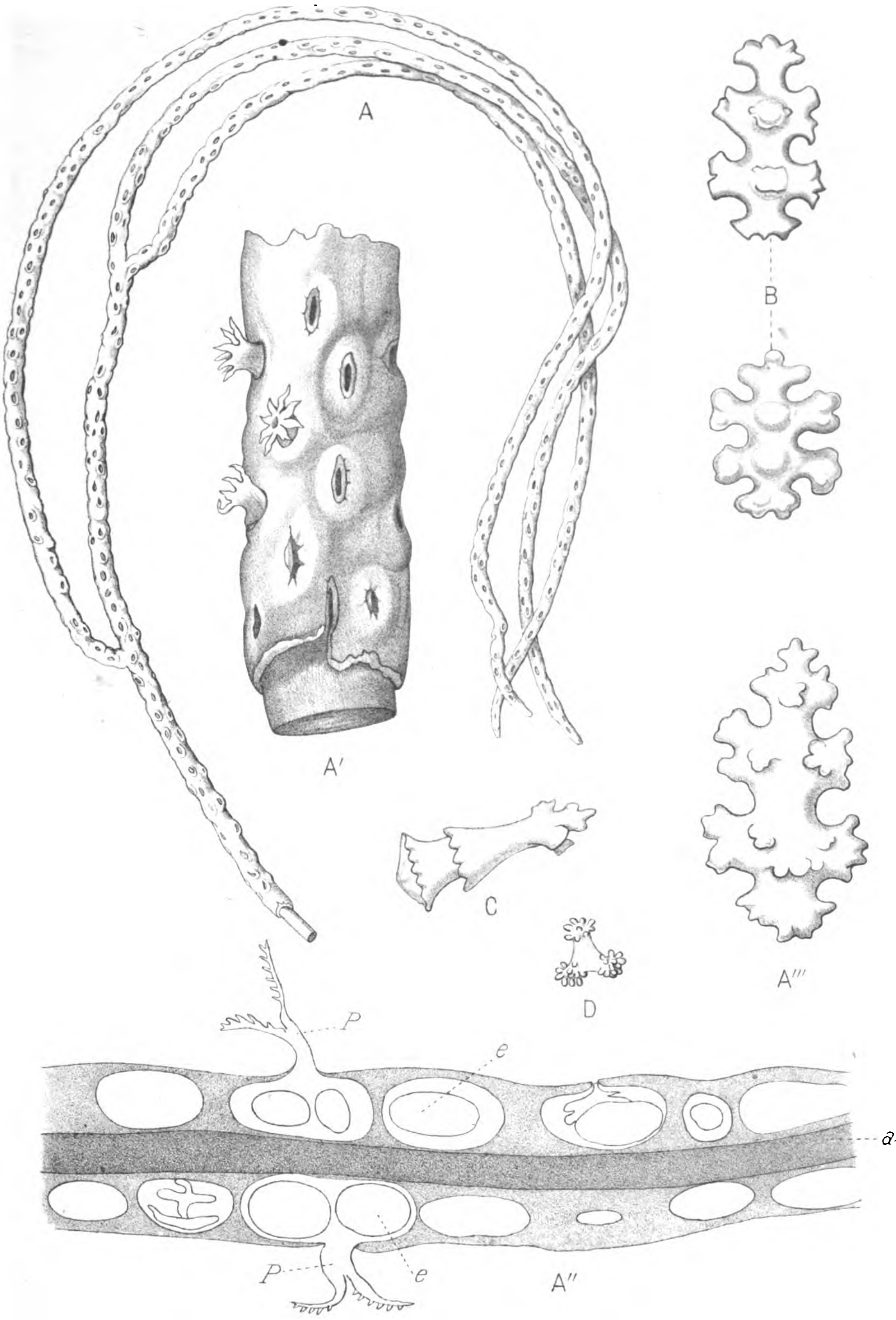
Edwin Wilson Camb. lith.

CAPE ALCYONARIA. PLATE IV.



A A′. Alcyonium antarcticum W & S.
B B′. Acrophytum claviger. Nov. gen et spec.
C. Heteroxenia capensis. Nov. spec.

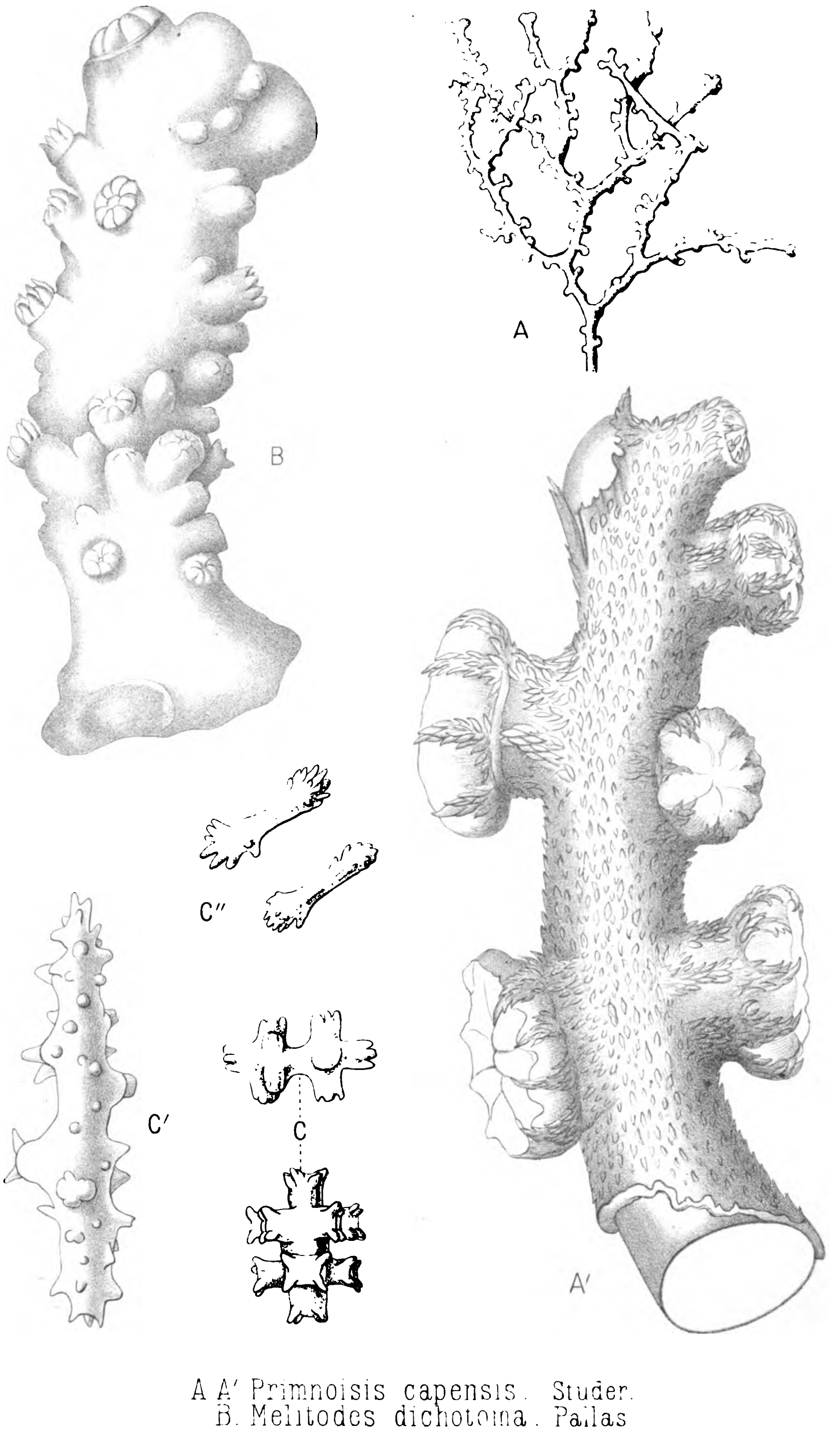
CAPE ALCYONARIA. PLATE V.



A A′A″A‴ Gorgonia capensis. Nov spec.
B. Gorgonia flammea. Ellis
C. Eunicella papillosa. Esper.
D. Juncella elongata. Val.

E. Wilson, Cambridge.

CAPE ALCYONARIA. PLATE VI.



A A′ Primnoisis capensis. Studer.
B. Melitodes dichotoma. Pallas
C C′ C″ Sarcophytum trochiforme. Nov. Spec

E. WILSON, CAMBRIDGE

3 2044 107 213 043

C